

ABSTRACT

[0044] A method and mold for creating nanoscale patterns in an ion-selective polymer membrane is provided, in which a mold comprising a substrate and a molding layer having at least one protruding feature is imprinted on the ion-selective polymer membrane, thereby creating a recessed feature in the membrane. Protruding features having nanoscale dimensions can be created, e.g., by using self-assembled nanostructures as a shadow mask for etching a molding layer. In one embodiment, an imprinted ion selective polymer membrane, suitable for use as a solid electrolyte, is adapted for use in an electrochemical device or fuel cell by adding a metal catalyst to one portion of the membrane to serve as a catalytic electrode.